

IN THE CLAIMS

Claim 1 (Previously Presented): An aqueous suspension comprising a component (1) comprising one or more pigments, fillers or minerals, and optionally (2) a dispersant polymer to stabilise the rheology of the suspension, wherein,

a) said component (1) comprises a natural carbonate and the reaction product or products of said carbonate with gaseous CO_2 and the reaction product or products of said carbonate with one or more medium-strong to strong H_3O^+ ion-providers, and

b) wherein said suspension has a pH greater than 7.5 measured at 20° C, and wherein paper filled or coated by treating with said suspension, at a constant area and thickness, weighs less than paper treated with said suspension but without said reaction products.

Claim 2 (Previously Presented): The aqueous suspension according to Claim 1 wherein the natural carbonate is a natural calcium carbonate (CaCO_3).

Claim 3 (Previously Presented): The aqueous suspension according to Claim 1, wherein the strong H_3O^+ ion-provider is selected from the group consisting of hydrochloric acid, sulphuric acid and mixtures thereof, and the medium-strong H_3O^+ ion-provider is selected from the group consisting of H_2SO_3 , HSO_4^- , H_3PO_4 , oxalic acid and mixtures thereof.

Claim 4 (Previously Presented): The aqueous suspension according to Claim 2, wherein the quantity in moles of the medium-strong to strong H_3O^+ ion-provider relative to the number of moles of CaCO_3 is in total between 0.1 and 2.

Claim 5 (Previously Presented): The aqueous suspension according to Claim 1, wherein the pigment, filler or mineral has a BET specific surface area, measured in accordance with the ISO 9277 Standard, of between $5 \text{ m}^2/\text{g}$ and $200 \text{ m}^2/\text{g}$.

Claim 6 (Previously Presented): The aqueous suspension according to Claim 1, wherein the pigment, filler or mineral has the following characteristics:

- a mean grain diameter, measured by the sedimentation method on a Sedigraph 5100™, between 50 and 0.1 micrometers, and
- a BET specific surface area, measured in accordance with ISO 9277, ranging from $15 \text{ m}^2/\text{g}$ to $200 \text{ m}^2/\text{g}$.

Claim 7 (Previously Presented): The aqueous suspension according to Claim 6 wherein the pigment, filler or mineral has the following characteristics:

- a mean grain diameter, measured by the sedimentation method on a Sedigraph 5100™, between 7 and 0.7 micrometers, and
- a BET specific surface area, measured in accordance with ISO 9277, ranging from $30 \text{ m}^2/\text{g}$ to $60 \text{ m}^2/\text{g}$.

Claim 8 (Previously Presented): A pigment, filler or mineral in the dry state obtained by drying the aqueous suspension according to Claim 1.

Claim 9 (Previously Presented): A process for treating pigments, fillers or minerals in an aqueous suspension, wherein said pigments, fillers, or minerals comprise a natural carbonate, comprising

treating said pigments, fillers or minerals with a combination of one or more medium-strong to strong H_3O^+ ion-providers and gaseous CO_2 , to provide a treated aqueous suspension,

wherein a paper filled or coated by treating the paper with said treated aqueous suspension weighs less than paper treated with said aqueous suspension, wherein both the paper treated with the treated aqueous suspension and the paper treated with the aqueous suspension have equal areas and thicknesses.

Claim 10 (Previously Presented): The process according to Claim 9, wherein the gaseous CO_2 comes from an external CO_2 supply or from the recirculation of CO_2 or from the continuous addition of the same or another medium-strong to strong provider of H_3O^+ ions as used in the treatment or from an excess pressure of CO_2 .

Claim 11 (Previously Presented): The process according to Claim 9 comprising the following three stages:

- a) treatment with one or more medium-strong to strong providers of H_3O^+ ions
- b) treatment with gaseous CO_2 , wherein the treatment with gaseous CO_2 is carried out in a manner selected from the group consisting of concurrent treatment during a), treatment in parallel with a), and treatment after a)
- c) raising of the pH beyond 7.5, measured at 20° C, in a time interval after the end of stages a) and b) of between 1 hour and 10 hours without addition of a base, or immediately after the end of stages a) and b) with the addition of a base, stage c) being the final stage in the process.

Claim 12 (Previously Presented): The process according to Claim 11, wherein stages a) and b) may be repeated several times.

Claim 13 (Previously Presented): The process according to Claim 11, wherein the pH measured at 20° C is between 3 and 7.5 during stages a) and b) of the treatment and the treatment temperature is between 5° C and 90° C.

Claims 14-15 (Canceled).

Claim 16 (Previously Presented): The process according to Claim 11, wherein the duration of stage b) of the treatment is between 0 hours and 10 hours.

Claim 17 (Previously Presented): The process according to Claim 9, wherein the pigments, fillers, or minerals comprising a natural carbonate are selected from the group consisting of a natural carbonate, a carbonate containing a dolomite, mixtures thereof with talc, mixtures thereof with kaolin, mixtures thereof with titanium oxide (TiO₂), magnesium oxide (MgO), and other minerals which are inert towards medium-strong to strong H₃O⁺ ion-providers.

Claim 18 (Previously Presented): The process according to Claim 17, wherein the natural carbonate is a marble, a calcite or a chalk.

Claim 19 (Previously Presented): The process according to Claim 9, wherein the strong provider or providers of H₃O⁺ ions is hydrochloric acid or sulphuric acid and the

medium-strong provider or providers of H_3O^+ ions is selected from the group consisting of H_2SO_3 , HSO_4^- , H_3PO_4 and oxalic acid.

Claim 20 (Previously Presented): The process according to Claim 11, further comprising the addition of a dispersing agent and optionally a reconcentration stage, after the third stage of treatment.

Claim 21 (Previously Presented): A treated aqueous suspension comprising treated pigments, fillers, or minerals,

wherein the treated pigments, fillers, or minerals comprise a natural carbonate, and

wherein the treated aqueous suspension is produced by the process of Claim 9.

Claim 22 (Previously Presented): The treated aqueous suspension according to Claim 21, wherein the pigments, fillers, or minerals comprising a natural carbonate are selected from the group consisting of a natural carbonate, a carbonate containing a dolomite, mixtures thereof with talc, mixtures thereof with kaolin, mixtures thereof with titanium oxide (TiO_2), magnesium oxide (MgO), and other minerals which are inert towards medium-strong to strong H_3O^+ ion-providers.

Claim 23 (Previously Presented): A pigment, filler or mineral in the dry state, obtained by drying an aqueous suspension according to Claim 21.

Claim 24 (Previously Presented): A preparation for use in paper-making, comprising at least one aqueous suspension according to Claim 1.

Claim 25 (Previously Presented): A process for coating paper comprising applying the aqueous suspensions as claimed in Claim 1 onto a sheet of paper.

Claim 26 (Previously Presented): A process for making a paper sheet with a paper filler comprising manufacturing a sheet of paper with the aqueous solution claimed in Claim 1, wherein the paper treated with the aqueous solution, wherein the aqueous solution was modified as described in a) before treating the paper, weighs less than a second paper of equivalent area and thickness treated with the aqueous solution, wherein the aqueous solution used to treat the second paper was not modified as described in a).

Claim 27 (Previously Presented): A process for coating and manufacturing a sheet of paper comprising coating and impregnating, in any order, a sheet of paper with the aqueous solution claimed in Claim 1 wherein said aqueous solution acts as a paper filler and as a preparation for coating and pigmentation of the surface of the paper.

Claim 28 (Previously Presented): The process as claimed in Claim 26 wherein the weight of the paper produced is reduced by 3% to 15% relative to the weight of the second paper.

Claim 29 (Previously Presented): A paint or coating comprising the aqueous solution as claimed in Claim 1.

Claim 30 (Previously Presented): A process for manufacturing a sheet of paper or board comprising incorporating a suspension or preparation according to Claim 1 in a process

of manufacture of the sheet in terms of the preparation of a thick stock or a thin stock or both, one or more times.

Claim 31 (Previously Presented): A process for manufacturing a sheet of paper or board comprising incorporating a suspension or preparation according to Claim 1 in the process of manufacture of said sheet wherein said suspension or preparation is added to a recycled white liquor or to a recycled coating broke.

Claim 32 (Previously Presented): A process for manufacturing a sheet of paper or board comprising incorporating a suspension or preparation obtained by the process according to Claim 9 in said process of manufacture of said sheet wherein said suspension or preparation is added to a recycled white liquor or to a recycled coating broke.

Claim 33 (Previously Presented): A process for manufacturing a sheet of paper or board comprising incorporating a suspension or preparation according to Claim 1 in the process of manufacture of said sheet wherein said sheet is obtained from cellulose fibres made from wood.

Claim 34 (Previously Presented): A process for manufacturing a sheet of paper or board comprising incorporating a suspension or preparation according to Claim 1 in the process of manufacture of said sheet wherein said sheet is obtained from fibres not originating from wood.

Claim 35 (Previously Presented): A paper or board obtained by the process as claimed in Claim 30.

Claim 36 (Previously Presented): A method of printing comprising digitally applying ink onto the paper or board claimed in Claim 35.

Claim 37 (Previously Presented): The aqueous suspension claimed in Claim 1 wherein the natural carbonate is selected from the group consisting of marble, calcite, chalk and carbonate containing dolomite.

Claim 38 (Previously Presented): The aqueous suspension according to Claim 4, wherein the quantity in moles of the medium-strong to strong H_3O^+ ion-providers relative to the number of moles of CaCO_3 is in total between 0.25 and 1.

Claim 39 (Previously Presented): The aqueous suspension according to Claim 1, wherein the pigment, filler or mineral has a BET specific surface area, measured in accordance with the ISO 9277 Standard, of from $20 \text{ m}^2/\text{g}$ to $80 \text{ m}^2/\text{g}$.

Claim 40 (Previously Presented): The aqueous suspension according to Claim 1, wherein the pigment, filler or mineral has a BET specific surface area, measured in accordance with the ISO 9277 Standard, of from $30 \text{ m}^2/\text{g}$ to $60 \text{ m}^2/\text{g}$.

Claim 41 (Previously Presented): The aqueous suspension according to Claim 6, wherein the pigment, filler or mineral presents the following characteristics:

- a mean grain diameter, measured by the sedimentation method on a Sedigraph 5100™, between 25 and 0.5 micrometers, and

- a BET specific surface area, measured in accordance with ISO 9277, ranging from 20 m²/g to 80 m²/g.

Claim 42 (Previously Presented): The process as claimed in Claim 10, wherein the CO₂ pressure is from 0.05 to 5 bars.

Claim 43 (Previously Presented): The process as claimed in Claim 11, wherein the raising of the pH beyond 7.5, measured at 20° C, in a time interval after the end of stages a) and b) of between 1 hour and 5 hours without addition of a base, or immediately after the end of stages a) and b) with the addition of a base, stage c) being the final stage in the process.

Claim 44 (Previously Presented): The process as claimed in Claim 13 wherein the treatment temperature is between 45 and 60°C.

Claim 45 (Previously Presented): The process as claimed in Claim 16 wherein the duration of stage b) of the treatment is between 2 hours and 6 hours.

Claim 46 (Previously Presented): A preparation for use in paper-making, comprising at least one aqueous suspension according to Claim 21.

Claim 47 (Previously Presented): A process for coating paper comprising applying the aqueous suspension as claimed in Claim 21 onto a sheet of paper.

Claim 48 (Previously Presented): A process for making a paper sheet with a paper filler comprising manufacturing a sheet of paper with the aqueous suspension claimed in Claim 21.

Claim 49 (Previously Presented): A process for coating and manufacturing a sheet of paper comprising coating and impregnating, in any order, a sheet of paper with the aqueous solution claimed in Claim 21 wherein said aqueous solution acts as a paper filler and as a preparation for coating and pigmentation of the surface of the paper.

Claim 50 (Previously Presented): A paint or coating comprising the aqueous suspension as claimed in Claim 21.

Claim 51 (Previously Presented): A process for manufacturing a sheet of paper or board comprising incorporating a suspension or preparation according to Claim 21 in the process of manufacture of the sheet in terms of a preparation of a thick stock or a thin stock or both, one or more times.

Claim 52 (Previously Presented): A process for manufacturing a sheet of paper or board comprising incorporating a suspension or preparation according to Claim 21 in the process of manufacture of said sheet wherein said suspension or preparation is added to a recycled white liquor or to a recycled coating broke.

Claim 53 (Previously Presented): The process claimed in claim 33 wherein said cellulose fibers are from a deciduous or resinous wood.

Claims 54-60 (Canceled).